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Conservation Service

Montana Agricultural Experiment Station

Bozeman, Montana

## MONTANA WATER SUPPLY OUTLOOK

Devel Sto

Snowpack and Streamflow Forecasts as of April 1, 1984

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE SNOW SURVEY UNIT

Federal Bldg., Rm. 443 10 East Babcock Bozoman, MT 59715

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The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff. Room 443, Federal Building, 10 East Babcock, Bozeman, Montana.



### March snowfall improves

Heavy snowfall during March throughout southwestern, central and westcentral Montana improved mountain

However, the northwest corner of the State and areas along the Continental Divide from Rogers Pass into Canada did not receive this heavy snowfall and the winter's accumulation of snow is still only 50 to 60 percent of average.

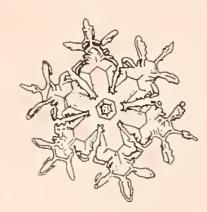
Southwestern Montana continues to receive its share of the snowstorms and has near average or a little above average snowpack.

The headwaters of the Yellowstone River have received some snow but snowpack remains below average.

Most mountain locations in Montana received 3 to 5 inches of moisture during March. Some of the heavier snowfall areas recorded 6 to 8 inche of additional moisture added to the snowpacks.

Snow at lower elevations and on south-facing slopes is beginning to melt. As temperatures increase, the snowline will begin receding up the mountain.



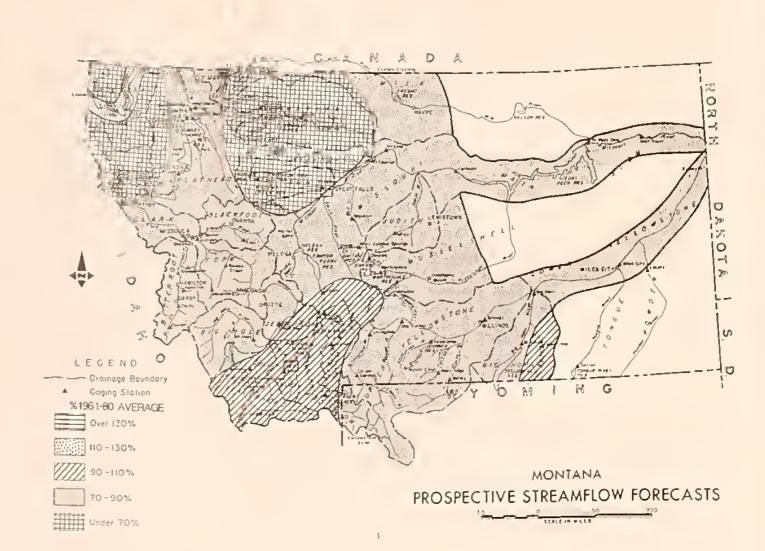


#### Statewide water shortages possible

Spring and summer streamflows are forecast to be well below average for the majority of streams and rivers in the State.

Some areas in northwest and northcentral Montana could have near record low runoff if spring rains continue to follow the below average trends of this winter's snowfall. A part of the Missouri River headwaters is the only area where runoff is expected to be near average.

Shortages in irrigation water supplies could begin developing much earlier than usual and could be quite severe in low-runoff areas without stored



## Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS			YEAR	,,	17 1ECO#5		TEAR		*1:CO+0
			ECAST	T-OUSA	CACAS ATST		Percent of		ACPS FEET
RASIN STREAM WATER PORECAST POINT		Property &	Perzons at Average	Lapryso		Thousand Area Fear	Toursta.	LPS( Pajo	4 -5.46.
PT	PIGG		April -	Septem	ber		April	- July	
RED ROCK RIVER mear Honids (I)		113	110	186	103	106	110	159	96.3
BEAVERHEAD RIVER near Grant (2)		170	108	250	128	146	107	197	137
BEAVERHEAD RIVER at Barratts (2)		212	101		209	186	103		180
RUBY RIVER near Alder		109	108		101	92.0	109		84.6
BIG NOLE RIVER near Melrose		640	84		760	590	84		698
BOULDER RIVER near Boulder		Streamf	low meas	Urement	98.7	discon	Linued		87.8
WILLOW CREEK near Harrison		20.5	102	an cancille	20.0	18.5	104		17.8
MADISON RIVER near Grayling (3)		452	91	532	496	355	91	408	388
MADISON RIVER near McAllister (4)		843	99	947	848	671	100	749	672
GALLATIN RIVER near Gateway		530	97	534	545	455	98	451	464
INFLOW HIDDLE CREEK RESERVOIR near Bozeman (5)		27.3	97	26.3	28.6	23.6	97	22.5	24.7
HYALITE CREEK near Bozeman (6)		43.0	96		44.8	37.2	96		38.7
GALLATIN RIVER at Logan		575	94		611	498	95		523
MISSOURI RIVER at Tonton (7)		2390	94	2885	2,545	2024	92	2385	2,196
SHEEP CREEK near White Sulphur Springs	4 .	19.2	88	16.8	21.8	16.7	88	13.0	19.0
SUN RIVER at Gibson Dam (8)		330	58	349	570	300	57	304	522
BELT CREEK near Monarch		12 I	90	347	134	110	89		123
MISSOURI RIVER at Fort Benton (9)		3392	85		3,980	2880	85		3,468
TWO MEDICINE CREEK near Browning (10)		171	69		248	159	68		235
BADGER CREEK near Browning		88.0	68		130	76.0	67		113
INFLOW SWIFT RESERVOIR near Dupuyer		60.0	69	51.7	86.7	51.0	68	41.9	74.7
CUT BANK CREEK at Cut Bank		75.0	66	D 4 - 1	114	69.0	64		108
MARIAS RIVER near Shelby		325	60	247	542	300	58	232	518
MISSOURI RIVER at Virgelle (11)		3729	82	,	4,570	3300	82		4,030
MISSOURI RIVER near Landunky (11)		4130	83		4,980	3635	83		4,383
NORTH FORK MUSSELSHELL RIVER near Delpine		5.5	86		6.4	4.6	85		5.4
SOUTH FORK MUSSELSHELL RIVER above Martinadale		50.2	80		62.8	48.0	81		58.9
MISSOURI RIVER below Fort Peck Dam (II)		4025	81		4,961	3585	81		4,428
MILK RIVER at Eastern Crossing		232	94		248	00.0	•		7,720
MILK RIVER at Eastern Crossing (12)		65.4	80		81.7				
INFLOW LAKE SAKAKAWEA, ND (11)		10200	80		12,755	9290	80		12,239
			00		121100	12,0			16,207
SASKATCHEWAN RIVER BASIN									
SWIFTCURRENT CREEK at Sherburne (13)		102	80	100	128	88.0	79	87.9	112
ST. MARY'S RIVER near Babb (13)		375	77		487	315	76		416

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3	THE PERSON NAMED IN COLUMN	U/////////////////////////////////////	The state of the s	WATER SUPPLY OUTLOOK Expres	sed as "Poor, Fe it" With Respect i	or, Average, Exc to Usual Supply	
		37784111188888	V *	STREAM IN AREA	Flam Pa	Lare	
			orn ( /)		Season	Season	
```	Y. C 1//		, L L	Beaverhead	Avg	Avg	
٦ ک	Langer Ville		t S H E L	Ruby Big Hole	Avg Fair	Avg Fair	
	***************************************			Boulder	Fair	Poor	
`♥' _ }	<b>20</b> 27//80///	NIM -	A get	Jefferson	Fair	Poor	
0 }	U1994/1944/1	//DIF \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	11/2	Nadison	Avg	Avg	
_ {	~ Y////////////////////////////////////			Gallatin	Avg	Avg	
> >				West-Side Missouri	Fair	Poor	
	C	S <sub>a</sub>		Smith-Belt	Fair	Fair	
* 🗸	THE STATE OF THE S			Sun	Poor	Poor	
	1 186449803981090	1		Teton	Poor	Poor	
LEGEND O	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		,	Marias	Poor	Poor	
Droinage Boundary	~ Y <i>IIIIIIIII</i>		1	Judith	Fair	Fair	
A Goging Station	<u> </u>			Musselshell	Fair	Fair	
%1961-80 AVERAGE	V/////////	5		Milk Bear Paws	Poor	Poor	
Over 130%	William 3	7		St. Mary's	Avg Fair	Avg Poor	
# Trans 1 To 1	8-3	5	l,		1011	1001	
110 - 130%							
90 -110%					-	-	

# Bear Paws ..... St. Mary's .....

#### MISSOURI RIVER & HUDSON BAY DRAINAGES MONTANA

MOUNTAIN SNOW WATER EQUIVALENT

Beaverhead	RIVER BASIN and ar	Humber of Courses	HATER AS	THE SHOP
Ruby	SUB WATERSHED	Averaged	Satt Year	Atmata
Ruby	Benverhend	21	0.1	07
Big Role       27       88       87         Roulder       15       101       88         Jefterson       87       87       93         Madison       36       82       86         Gallatin       24       103       94         Missouri Readwater       147       88       91         West-side Missouri       (Toston-Cacade)       11       96       75         Smith-Belt-Arrow       11       109       89         Missouri Main-stem       22       104       83         Teton & Sun       12       69       44         Narias-Teton-Sun       19       75       52         Judith-Musselshell       19       137       101         Milk       11       92       67         Bear Paws       6       439       110         Missouri (Total)       207       92       87         Saskatchewan       7       72       61				
Boulder       15       101       88         Jefterson       87       87       93         Nadison       36       82       86         Gallatin       24       103       94         Missouri Readwater 147       88       91         West-side Missouri       10       89         (Toston-Cacade)       11       96       75         Smith-Relt-Arrow       11       109       89         Missouri Naiu-stem       22       104       83         Teton & Sun       12       69       44         Narias-Teton-Sun       19       75       52         Judith-Musselshell       19       137       101         Milk       11       92       67         Bear Paws       6       439       110         Missouri (Total)       207       92       87         Saskatchewan       7       72       61	Riv Hote			
Jefferson	Boulder			
Nadison				
Gallatin       24       103       94         Nissouri       147       88       91         West-side Minsouri       (Toston-Cacade)       11       96       75         Smith-Relt-Arrow       11       109       89         Nissouri       Nain-slem       22       104       83         Teton       8 Sun       12       69       44         Narias       7       79       58         Narias-Teton-Sun       19       75       52         Judith-Musselshell       19       137       101         Nilk       11       92       67         Bear Paws       6       439       110         Missouri       (Total)       207       92       87         Saskatchewan       8t       7       72       61			~ "	
Nissouri Readwater 147   88   91			~ =	
West-side Missouri (Toston-Cacade) 11 96 75 Smith-Belt-Arrow 11 109 89 Missouri Main-slem 22 104 83 Teton & Sun 12 69 44 Marias 7 79 58 Morias-Teton-Sun 19 75 52 Judith-Musselshell 19 137 101 Milk				
(Toston-Cacade)     11     96     75       Smith-Belt-Arrow     11     109     89       Missouri Main-slem     22     104     83       Teton & Sun     12     69     44       Narias     7     79     58       Marias-Teton-Sun     19     75     52       Judith-Musselshell     19     137     101       Milk     JI     92     67       Bear Paws     6     439     110       Missouri (Total)     207     92     87       Saskatchewan     7     72     61			00	7.
Smith-Belt-Arrow     11     109     89       Missouri Main-slem     22     104     83       Teton & Sun     12     69     44       Narias     7     79     58       Marias-Teton-Sun     19     75     52       Judith-Musselshell     19     137     101       Milk     11     92     67       Bear Paws     6     439     110       Missouri (Total)     207     92     87       Saskatchewan     7     72     61		_	9.6	7.5
Missouri Main-slem 22 104 83 Teton & Sun 12 69 44 Marias 7 79 58 Marias-Teton-Sun 19 75 52 Judith-Musselshell 19 137 101 Milk 11 92 67 Bear Paws 6 439 110 Missouri (Total) 207 92 87  Saskatchewan St. Nary's 7 72 61				. –
Teton & Sun 12 69 44 Narias 7 79 58 Narias **Teton-Sun 19 75 52 Judith-Musselshell 19 137 101 Nilk 11 92 67 Bear Paws 6 439 110 Nissouri (Total) 207 92 87  Saskatchewan St. Nary's 7 72 61		n 22		
Narias	Teton & Sun	12		
Norias-Teton-Sun   19   75   52     Judith-Musselshell   19   137   101     Nilk   11   92   67     Bear Paws   6   439   110     Nissouri (Total)   207   92   87     Saskatchewan   St. Mary's   7   72   61	Marias	7		
Judith-Musselshell       19       137       J01         Milk       J1       92       67         Bear Paws       6       439       110         Missouri (Total)       207       92       87         Saskatchewan       7       72       61		19	7.5	
Milk     11     92     67       Bear Paws     6     439     110       Missouri (Total)     207     92     87       Saskatchewan     7     72     61		1 19	137	
Nissouri (Total) 207 92 87  Saskatchewan St. Hary's 7 72 51	Milk	11	92	
Missouri (Total) 207 92 87  Saskatchewan St. Mary's 7 72 51	Bear Pays	6	439	0.11
St. Mary's 7 72 61	Missouri (Total)	207	92	87
St. Mary's 7 72 61				
Row River in		7	7.2	bΙ
Alberta 11 89 77				

70-90%

Under 70%

### Missouri snowpack variable

Southwestern and central mountain ranges had good snowfall during March. The area along the Continental Divide from Glacier National Park to Rogers Pass did receive some snow but not enough to overcome earlier deficiencies. Snowpack continues to be 50 to 60 percent of average in this area.

Snowpack is below average in the Upper Big Hole and Madison River drainages, and near or above average in the remainder of the Missouri River headwaters above Three Forks.

Smaller mountain ranges in central Nontana generally have above average snowpack.

Some melt has occurred at lower elevations and on south-facing slopes.

## (1) Adjusted for storage in Lina

- (2) Adjusted for storage to Lina and Clark Canyon Reservoirs.
  (3) Adjusted for storage in Hebgen
- Lake.
  (4) Adjusted for storage in Hebgen
  Lake and Ennis Lake.
  (5) Sum of West Fork Hyalite Creek and
  East Fork Hyalite Creek above the
- Reservoir.
  (6) Adjusted for storage in Hiddle
- Creek Reservoir.
  (7) Adjusted for storage in Lima, Reb-gen, Ennis & Clark Canyon Reser-
- (8) Adjusted for storage in Gibson Reservoir & diversions. (9) Adjusted for atoroge in Lina, Clark Canyon, Hebgen, Ennis, Gib-son, Pishkun, Willow Creek &
- Canyon Ferry Reservoirs.
  (10) Adjusted for storage in Two Medicine Reservoir & diversions in
- Two Medicine Canal.
  (11) Adjusted for all upstream reservoirs.
  (12) Flow at Eastern Crossing
- minus St. Hary's Canal.
  (13) Adjusted for storage in Loke
- ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

## Most drainages

### below average

Runoff forecasts have increased slightly on most streams. The Beaverhead, Ruby, Madison and Gallatin Rivers are expected to have rumoff near or a little above average. However, allother drainages are forecast to have below to well below average runoff.

Mid- to late season shortages of irrigation water are expected on the Big Hole and Boulder Rivers in the Missouri River headwaters and on all tributaries to the Missouri below Canyon Ferry Reservoir.

If spring rains follow the snowpack trends and are below average, streams in the Milk, Marias, Teton, Sun and Dearborn drainage could produce runoff near the lowest on record.

Irrigators in these areas not having stored water need to be prepared for a greatly reduced water supply.



MOUNTAIN STREAMS ARE GENERALLY FREE OF SNOW AND WILL SOON BE CARRYING SNOWMELT WATER TO DOWNSTREAM AREAS.

# Yellowstone River Drainage

STREAMFLOW FORECASTS			S TEAST		4 41 1487	THIS Y		10003000	11 COAD
BASIN, STREAM Indian FORECAST POINT		Apre Feel	And Phil	Lat ***	1 - 111	Thousand from Feet	Persons of	5411142	Name of the second
	PERIOD		April -	Septe-be	r			- July	
YELLOWSTONE RIVER at Corvin Springs YELLOWSTONE RIVER near Livingston BOULDER RIVER at 8ig Timber STILLWATER near Absarokee (1) CLARKS FORK RIVER near Belfry ROCK CREEK near Red Lodge INFLOW COONEY RESERVOIR near Boyd (2) YELLOWSTONE RIVER at Billings BIGHORN RIVER near St. Novier (3) LITTLE BIGHORN RIVER near Hardin TONGUE RIVER near Decker YELLOWSTONE RIVER at Miles City (4) POWDER RIVER at Moorhead YELLOWSTONE RIVER near Sidney (5)		1650 1930 294 500 455 8tre 50.0 3680 1512 176 258 5425 226 5930	81 81 74 79 72 22 33 83 82 77 97 96 80 86 79	1725 3xuremen 3133 2060	2.027 2.379 398 632 628 Ls 115 60.5 4.516 1,976 182 269 6,787 263 7,518	1380 1610 270 415 410 discont 41.0 3131 1370 157 235 4720 208 5170	82 82 74 79 73 100ed b 83 82 76 97 96 80 86	1397 y USGS 3793 1849	1,686 1,969 360 528 563 88.1 49.5 3,833 1,794 162 244 5,906 243 6,544

(1) Adjusted for storage in Mystic Lake.

- (2) Adjusted for storage in Nystle Lake.
  (3) Adjusted for storage in Cooney Reservoir.
  (3) Adjusted for storage in Buffalo Bill, Boyaen, Bull Lake, Filot Butte and Bighorn Reservoirs.
  (4) Adjusted for storage in Bull Lake, Buffalo Bill, Boyaen, Pilot Butte, Bighorn and Tongue River Reservoirs.
  (5) Adjusted for reservoirs shown in (4) and diversions into the Lover Yellowstone Canal.

MONIANA

MOUNTAIN SNOW WATER EQUIVALENT

CANADA

LEGEND

--- Orainage Boundary

▲ Goging Station

%1961-80 AVERAGE

Over 130%

110 - 130%

90-110%

70-90%

Under 70%

### ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

### Snowpack

#### improves slightly

Showpack in the Yellowstone River headwaters, in and near Yellowstone National Park, improved a little with March snowfall.

However, almost all of the Yellowstone River drainage still has below average snowpack. The only areas with better conditions are along the Gallatin Range and Crazy Mountains. These areas have near to a little above average snowpack.

Some melt has occurred at lower devations and on south-facing

#### slopes. SUMMARY of SHOW MEASUREMENTS Upper Yellowatone ab Livingston .. 20 Boulder & Stillwater .... Rock Creek & Clark's Fork ... Yellowstone (ab Bighorn River) . 59 Bighorn/Wyoming . 29 101 Little Bighorn .. 117 Bighorn (Total) . 32 102 125 Tongue ..... Powder ..... 106 Yellowstone (Total) ..... 104 101 YELLOWSTONE RIVER DRAINAGE

#### Tongue ..... Fair Fair Fair Fair Lower Yellowstone ... Fair Fair

Yellowstone forecasts

WATER SUPPLY OUTLOOK Explanation of Proc. P. or. Assessed to

Fair

Avg

Falr

Fair

Poor

Poor

Yellowstone at

Livingston ....

Shields .....

Timber .....

Clark's Fork .....

Bighorn .....

Blghorn ......

Little Bighorn .....

Yellowstone above

Stillwater ..... Fair

Rock Creek ..... Falr

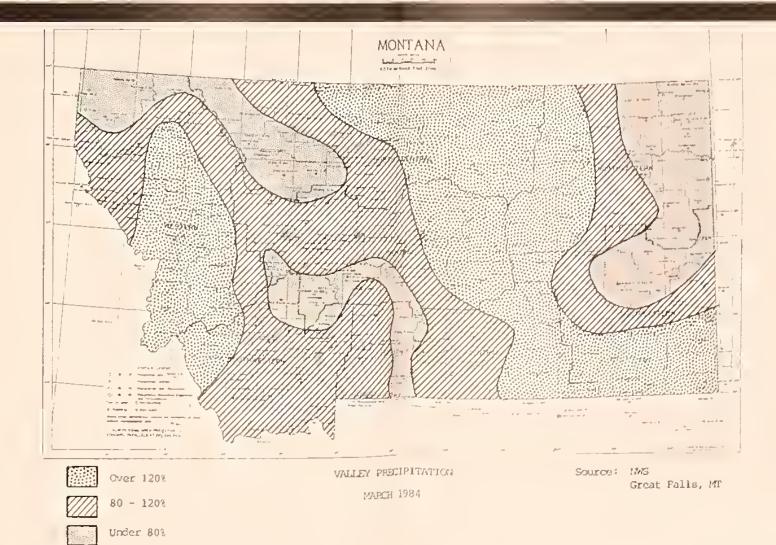
#### remain low

Spring and summer attreamflow forecasts are about the same as those issued last month. Runoff in expected to in 20 to 25 percent less than average on most streams

Streams llowing out of the Crazy Mountains should have runofts closer to average.

Mid- to late searon irrigation water shortages can be expected on most smaller drainages that flow into the Yellowatone River. Streamflown will begin to drop earlier thum

Irrigatorn with junior water rights should be prepared for a reduced water supply.



				D A '	TA			SMOW April 1, 1984			THE YEAR	_	PAST FI	ECGAD
SNOW :	SUR	ZVE	· Y	DΑ	IA		×	CRAMACE BASIN ME O SHOW COURSE		Date	Snew Deep	Rater Content	#ater Conte	
3NON .	<b>50</b> 1						*	HAVE	Elevetion .	ar Survey	(Inches)	(Inches)	LAU Year	Vinite
SNOW April 1, 1984			THIS YEAR			015000	*	FOOLHEN	8280	3/27	49	13.7	17.4	18.3
DRAINAGE BASIN MICH SHOW COURSE		Our of Survey	Sopre (Joseph (Joseph L)	Oprar Content (Inches)	Late As in	withway)	*	FOREST LAKE	6490	3/29	4.0	10.3	9.8	13.7
NAPK	[ later or					A1***0)1	*	FOUR MILE	6900 3480	3/29	3 \$ 1 4	9.0	10.9	9.4
ABUMDANCE LAKE	8800	3/27	61	18.3	8.05	22.0	*	FRED BURR PASS	8000	4/05	76	3.6 25.4	4.8 24.5	26.7
AMBROSE	6480	3/25	43 45	12.1	11.1	14.1	×	CREIGHT CREEK	6000	4701	5.9	8.7	10.1	16.7
ARCH FALLS	7350 4820	3/28	15	4.3	4.4	13.8 6.1	*	FRIDAY HILL	4620	3/26	40	13.0	22.4	24.5
ASHLEY DIVIDE	4000	3/28	14	3.7	4.3	5.6	*	FROHNER MEADOWS FROHNER MEADOWS PILLOW	6480 6480	3/26 4/01	26 5 P	6.8 8.3	6.8 7.3	8∵9 8∵8
BADGEP PASS	6900	4701	7.3	26.0A	29.6	40.4	-×	GARVER CREEK	4250	3/30	17	5.3	11.2	11.3
BADGER PASS PILLOW	6990	4/01	S P 107	21.8 44.2	26.T	36.4	*	GARVER CREEK RILLOW	4250	4/01	SP	4.2	10.6	10.2
BALD EAGLE PEAK	5700 7800	3/30 3/30	\$4	15.6	10.0	62.9 14.2	×	GIRGONS PASS	7100	3/26	73	22.3	24.8	24.2
BAUFIFLD MOUNIAIN	\$600	3/30	3.\$	11.4	24.0	24.5	*	GOLD CREEK LAKE	7000 7200	4/01 3/26	19 56	S.3 1S.S	6.3	11.5
BAYFIELD MOUNTAIN RILLOW	5600	4/01	\$ P	10.7	50:6	19.8	*	GOLD STONE	8100	3/26	63	16.6	18.0	18.2
BAREE GREEK	\$500	3/27	81	29.9	45.\$	48.9	*	GRASSHORPER	7000	3/27	5.3	6.2	\$.8	6.4
BARES MIDWAY	4600 3800	3/27 3/27	\$ 9 3	20.9	37.6	38.1	*	GRAVE CREEK	4300	3/30	3 3	11.8	14.8	18.3
BAREE TRAIL BARKER LAKES	82\$0	4/04	46	13.0	16.4	9.5	*	GRAVE CREEK PILLOW GRIFFIN CREEK DIVIDE	4300	4/01	S P	11.6	16.6	17.1
GARKER LAKES PILLOW	8250	4/01	5 P	14.4	17.9	16.9	*	GUNSIGHT LAKE	\$1\$D 6300	3/30	24 83	6.6 31.9	10:0 32:2	12.1
BASIN CREEK	7180	3/29	4.1	8.4	11.4	8.5	*	HA'ID CREEK	5030	3/28	3 2	9.2	11.8	15.0
BASIN CREEK PILLOW	7190	4/01	SR	8.1	9.4	8.1	*	MANO CREEK PILLOW	5030	4/01	SR	8.2	8.1	16.0
BASSOO PEAK	5150	3/30 3/88	13 37	4.1 8.6	7.3 8.6	11.2	**	HAWKINS LAKE	6450	3/30	\$ 8	19.7	32.1	33.5
BEAGLE SPRINGS BEAGLE SPRINGS PILLOW	8850 8850	4/01	5 P	9.2	9.0	9.5 9.5	*	HAWKINS LAKE RILLOW	6450	4/01	S R	16.2	28.1	30.9
BEAR BASIN	8150	3/28	79	23.0	21.6	25.3	*	HEART LAKE TRAIL HEBGEN DAM	4800 6580	4/02 3/29	4 O 4 6	15.8	15.4 15.5	23.0
BEAR PAN SKI AREA	\$200	3/29	2.7	8.4	2.3	7.7	*	HELL ROARING DIVIDE	\$770	3/30	71	24.0	29.3	33.1
BEAVER LAKE	\$900	4/01	44	14.0	15.8	24.8	*	HERRIG JUNCTION	4850	3/27	\$ 4	18.0	25.3	28.6
BERRY MEADOW	7000	3/29	31 111	8.0 42.0	8.0	8.3	×	HOL BROOK	4530	3/29	1.4	4.2A	4.8	10.2
BIC CREEK	6750 7700	3/31 3/30	61	18.2	49.3 15.6	47.2	*	HOOD MEADOW	6600	3/26	37	10:3	8.9	12.0
BIG SKY MENDOM	6350	3/28	4.1	11.1	10.2	10.2	*	HOODOO BASIN PILLOW	60\$0 60\$0	4/02	101 SR	3943 34.7	46.2	52.7
BIG SNOWY	7150	3/29	8.4	28.8	16.6	23.1	·×	HOOOOO CREEK	\$900	4/02	94	36.2	41.4	47.1 49.2
BLACK BEAR	7950	3156	107	37.1	48.4	43.9	*	INDEPENOTACE	7850	3/26	4.5	13.2	15.7	19.6
BLACK BEAR PILLOW	7950	4/01	S P	32.9	42.1	39.0	*	INTERGAARO	6450	3/30	29	7.5	6.4	9.3
STACK MODITATION	7750 7 <b>10</b> 0	3/29 3/27	68 42	16.5 10.4	14.5	16.7	×	JAHNKE LAKE TRAIL	7200	3/26	40	8.8	10.8	10.2
BLACK PINS BLACK PINS PILLOW	7100	4/01	5 P	12.1	11.0	14.7	*	JOHNSON PARK	6450	3/30	16	S.1	4.8	7.7
8F000A 01C<	7600	3/26	5.5	12.0	14.0	14.4	*	KEELER CREEK KINGS HIL	3300 7500	3/30	0 4 9	.0 13.6	6.6 10.8	11.3
BLOODY DICK PILLOW	7\$\$0	4/01	\$ P	11.6	12.8	12.9	*	KISHENEHN	3890	3/31	8	1.4	\$.1	7.8
BLUE LAKE	5900	4/01	4.7	15.8A	18.9	27.0	*	KINANIS CAMP	3720	3/29	0	. 0	.0	1.2
ROIS SOIS	77\$0	3/27	41	8.6	8.3	8.6	*	CRAFT CREEK PILLOW	4750	4/01	SP	9.7	9.8	12.4
BOULDER MOUNTAIN BOULDER MOUNTAIN PILLOW	7950 7950	3726 4701	66 S P	20.8	19.0	20.2	-X	LAKE CREEK	6100	3/28	3.4	95	10.5	9.2
BOX CANYON	6670	3/26	2.8	6.9	9.0	13.2	*	LAKEVIEW CANYON	6930	3/30	36	8.6	20.2	13.2
BOX CANYON PILLOW	6700	4/01	SP	4.3	7.1	11.2	*	LAKEVIEW RIDGE LAKEVIEW RIDGE PILLOW	7400 7400	3/30	3 4 S P	8.1 11.2	19.2 22.0	11.6 13.1
BRANHAM LAKES	8850	3/30	104	32.6	33.2	31.5	·*	LEMHI PASS	7480	3/29	4.2	9.2	7.8	9.6
BRIDGER BONL	7250	3/29	87	27.1	22.5	29.2	*	LEMHI RIOGE	8100	3/29	4.8	11.0	9:3	11.0
ARIDGER BOWL RILLOW BRISTOW CREEK	7250 3900	3/29 3/30	S P 0	27.2 ~0	22.1 5.7	27.7	×	LEMHI RIDGE PILLOW	8100	4/01	SP	12.3	9. 1	11.4
BRUSH CREEK TIMBER	5000	3/28	18	5.0	8.8	10.3	*	LICK CREEK	6860	3/27	4.8	11.9	9.2	11.0
BULL MOUNTAIN	6600	3/30	24	6.1	6.4	6.5	*	LICK CREEK PILLOW	6860 7400	4/01 3/28	5 P 6 3	11.0 17.0	9.5 16.1	16.1
CABIN CREEK	\$500	3731	3	. 9	2.4	7.0	×	LOGAN CREEK	4300	3/28	15	3.6	5.2	17.2 7.7
CALL ROAD	8050	3/27	51	13.3	14.6	13.0	*	LONE MOUNTAIN	8880	3/30	77	23.4	25.8	23.9
CALVERT CREEK	6430	3728	37	9.1	11.8	12.2	*	LOST HORSE	5940	3/29	79	27.2	8.85	34.4
********	*****	*****	****	*****	*****	*****	**	*********	*****	****	*****	*****	*****	****
SNOW April 1, 1984			TIUS TEAR		DAST	RECORD	*	SNOW April 1, 1984			THIS YEAR		PAST F	RECORD
DHARRAGE DASID and the SHOW COURSE			Snaw Droit		-	necond (	*	DRAINAGE BASIN end/or SNOH COURSE		Date		Werer Content		en (Incher)
DAU	[ leyenter	Dete e) \$-271+1	(Inthe) (	(16) Set)	LIII Year	Aytrojt	1	HAME	Elevation	Of Survey	Snew Depth (Incher)	(Inchee)	Lott Year	Average
CALLERY COSSY CALLOU	4/30	/ / 04		4.3		0.7	青女	LOST SOUL	4800	3/30	24	8.0	15.0	16.0
CALVERT CREEK PILLOW  CAMP MISERY	6430 6400	4/01 3/29	5 P 1 4 <b>1</b>	6.7 53.5	8.9 49.4	9:3 50:0	*	LOWER TWIN	7900	3/29	7.2	22.4	25.1	22.8
CAMP SENTA	7890	3/27	35	7.2	7:4	7.4	*	LOWER TWIN PILLOW	7900	4/01	S P	20.3	24.4	2173
CAPROT BASIN	9000	3/29	93	35.5	37.1	38.6	₩·	LUBRECHT FLUME	4680	3/30	0	.0	1.0	4.2
CARROT BASIN PILLOW	9000	4/01	SP	27.3	31.3	29.9	*	LUBRECHT FLUME PILLOW	4680	4/01	5 R	.0	1.0	5.5

SNOW APET 1, 1984		<del></del>	TIUS TEAR		PAST		* SNOW April 1, 1984			THIS YEAR			RECORD
DRAINAGE DASID and the SNOW COURSE DARG	[leymbra	Date of Surrey	Snew Droth (Inche) (	Here Control (16) Ne (1	Etti Year	Ayt (b) t	DRAINAGE BASIN ond/or SND# CDURSE  NAME	Elevation	Dete of Survey	Snew Depth (Incher)	Mercr Content (Inches)	Less Year	Ave-sije
CALVERT CREEK PILLOW	6430	4/01	5.0	4 7		0.1	LOS1 SOUL	4800	3/30	24	8.0	15.0	16.0
CAMP MISERY	6400	3/29	5 P 1 4 <b>1</b>	6.7 53.5	8.9	9.3 50.0	E LOWER TWIN	7900	3/29	7 2	22.4	25.1	22.8
CAMP SENIA	7890	3/27	35	7.2	7:4	7.4	LOWER TWIN PILLOW	7900	4/01	SP	20.3	24.4	2123
CAPROT BASIN	9000	3/29	93	35.5	37.1	38.6	& LUBRECHT FLUME	4680	3/30	0	. 0	.0	4.2
CARROT BASIN PILLOW	9000	4/01	SP	27.3	31.3	29.9	UBRECHT FLUME PILLOW	4680	4/01	5 R	. 0	1.0	5 5
CARTER CREEK	7400	4701	3.6	8.6	7.8	6.1	E LUBRECHT FOREST # 3	5450	3/30	16	4.8	4.9	7.5
CASHC CREEK	7800	4/02	3.8	11.2		=	LUBRECHT FORES1 # 4	4650	3/30	0	• 0	.0	2,4
CASHE CRESK PILLOW	7800	4/01	SP	9.1	10.0	9.3	LUBRECHT FOREST # 6	4040	3/30	0	.0	. 4	5.8
CEDAR GROVE	3760	3/30	0	. 0	9.4	13.2	LUBRECHT HYDROPLOT	4200	3/30	0	20:0	.0	5.0
CHESSMAN RESERVOIR	6200	3/26	1.5	3.4	3.4	3:9	MADISON PLATEAU	7750	3/26	66	50:0	27.3	24.5
CHICKEN CREEK	4060	3/27	3.1	10.0	11.1	15.5	* MADISON PUATEAU PILLOW	7750 4900	3/26 4/01	5 R	18.0	2649	25[2 21[7
LOVER MEADOW	8600	3/28	67	18.9	20:0	19,1	MANY GLACIER PILLOW	4900	4/01	37 5 P	13.2	18.5	19.3
CLOVER MEADOW PILLOW	8800	4/01	SP	50:3	13.1	17.9	* MARIAS PASS	\$250	3/30	32	12.1	15.6 16.4	18.5
OLE CREEK	7850	3/20	60	17.6	20.6	18.9	MAYNARD CREEK	6210	3/29	53	15.3	12:7	16.9
OLE CREEK PILLOW	7850	4/01	5 P	18.0	18.3	17.6	* MAYNARD CREEK PILLOW	6210	3/29	S P	12.2	10.4	13.3
OLLEY CREEK	6300	3/59	2 7	6.4	5 . 8	9.4	MIDDLE MILL CREEK	7850	3/30	70	19.7	21.5	17.8
NCITANIAMO	5600	3/27	5.0	5.4	4.8	6.6	* MILL CREEK	7500	3/29	44	12.0	9.0	14.5
OMBINATION PILLOW	5600	4/01	SP	4.9	4.5	6.6	MINERAL CREEK	4000	3/29	3.5	11.8	15.4	18.8
COOKE STATION	8150	3/28	51	14.8	17.4	21.0	MONUMENT PEAK	8850	3/26	64	19:4	23:4	2.812
COPPER BOTTOM PILLOW	\$200	3/31	19	6.6	5.4	11.4	MONUMENT PEAK PILLOW	8850	4/01	SP	16.7	17.0	24.3
OPPER CAMP	5200 6950	4 / 0 1 3 / 3 1	5 P 5 B	8.1	6.5	13.3	MOULTON RESERVOIR	68\$0	3/30	36	8.8	7.1	7.0
OPPER CAMP PILLOW	6950	4/01	5 P	19,1	24.5	32.8	MOUNT LOCKHART	6400	3/27	46	14.2	18.4	2454
TOPPER CREEK	\$700	3/31	25	19.5 8.5	23.5	39.3	MOUNT LOCKHART PILLOW	6400	4/01	SP	12.1	16.3	23.1
COPPER LAKE CREEK	6100	3/31	45	14.4	20.7	15.5	MUDD LAKE	7650	3/28	5.9	16.0	21.79	21.5
OPPER MOUNTAIN	7700	3/29	44	11.4	11.2	15:5	MULE CREEK	8300	3/27	4.6	12.0	14.75	16.0
COYOTE HILL	4200	3/29	16	5.0	\$.2	10.4	MULE CREEK PILLOW	8350	4/01	SP	12.7	13.3	15.6
CREVICE MOUNTAIN	8400	3/27	3.8	9.3	9.0	11.5	R NEVADA CREEK	6480	3/31	4.0	10.6	12.8	15.0
CRYSTAL LAKE	6050	3/29	60	19.0	9.4	15.1	X NEVADA CREEK PILLOW	6480	4/01	S R	7.8	11.6	14.3
CRYSIAL LAKE PILLOW	6050	4/01	S R	17.8	10.2	14.3	NEW WORLD	6900	3/59	5.7	1617	14.0	16.5
DAD CREEK LAKE	8400	3728	5.8	14.9	13.6	15.4	NIATHCOM HOTWIN	5600	3/26	7.3	22.5	39.2	39.5
DATSY PEAK	7600	3730	33	8.4	9.2	12.2	NEZ PERCE CAMP	5650	3/28	4.2	13.6	15.8	15.9
DALY CREEK	5780	3/27	4.2	10.9	10.6	12.7	NEZ PERCE CAMP PILLOW	\$650	4/01	S P	13.7	13.0	15.9
DALY CREEK PILLOW	5780	4/01	5 P	9.4	13.8	14.4	NEZ PERCE CREEK	6500	3/29	3.5	7.8	6.4	7.4
ARKHORSE LAKE	8600	3/27	8.5	25.7	24.6	28.9	NEZ PERCE PASS	6570	3/28	5 4	17.0	13.7	18.3
PARKHORSE LAKE PILLON	8700	4701	5 P	24.6	19.4	25.2	NOISY BASIN	6040	3/29	135	50.1	47.3	46.6
PAVIS CREEK	5400	3/30	45	15.0	26.8	26.2	NOISY BASIN PILLOW	6040	4/01	SP	45.9	43.7	40.5
DEADMAN CREEK	6450	3/88	3.6	10.6	9.4	12.2	* NORTH FK. ELK CREEK	6250	4/02	37	9.6	11.4	13.2
DEADMAN CREEK PILLOW	6450	4/01	S.P.	9.6	6.3	11.4	* NORTH FK! ELK CREEK PILLOW * NORTH FORK JOCKO	6330	4/01	S P	10.0	11.1	1371
DESERT MOUNTAIN	\$600	3/50	3.9	12.5	12.2	16.6	NORTH MEADOW	7\$00	3/31	104	39.8	39.7	47.6
PEVILS SLIDE PISCOVERY BASIN	8100	3/26	77	53.0	21.8	23.7	NORTHEAST ENTRANCE	7350	3/31	3.8 2.5	9.6	11.2 8.4	9.3
DIVIDE	7050 7800	3/27	50	11.7	9.0	11.1	MORTHEAST ENTRANCE PILLON	7350	4701	SP	6.5 7.3	8.5	10.1
DIVIDE PILLOW	7800	4/01	4 Q 5 P	12.5	15.5	12.0	* VOTCH	8500	3728	83	20.8	55.6	17.2
NIX HILL	6400	4/01	37	12.2	14.5	12.7	* OPHIR PARK	7150	4/01	59	17.9	15.6	18.5
UPHYER CREEK PILLOW	5750	4/01	SP	\$.2	7:3	11.4	PALISADE CREEK	9250	3/27	8.2	24.4	30.0	31.0
EAGLE CREEK	7000	3/29	49	14.2	11.4	15.6	PETERSON MEADOWS	7200	4/03	4.2	11.6	9.3	11.2
AST BOULDER S	9250	3/26	77	23. OA	26.5	15.5	PETERSON MEADOWS PILLOW	7200	4/01	S P	11.1	9.7	11.6
AST FORK R.S.	5400	3/26	1.5	4.4	5.6	32.8	PICKET PIN D	9450	3726	76	23.0A	22.0	27.5
L DORADO MINE	7800	3/26		19.2	19.8	22.8	PICKET PIN LOWER	6200	3/28	1.8	5.4	3.4	2.4
LK HORN SPRINGS	7800	3/27	3.4	7.5	9.0	9.9	* PICKET PIN NIDDLE	7250	3/28	3.8	11.2	7.2	14.1
LK PEAK	8000	3/27		16.7	14.3	18.3	PICKET PIN UPPER	8100	3/28	6.3	19.2	19.4	55.5
MERY CRESK	4350	3/29		12.0	12.4	16.3	PICKFOOT CRESK	6650	3/26	3.2	9. S	9.7	12.1
MERY CREEK PILLOW	4,350	4/01		11.6	16.8	16.5	PICKFOOT CREEK PILLOW	6650	4/01	\$ P	9.7	13.1	13.2
ATTY CREEK	5500	3731		22.0	25.7	25.0	* PIKE CREEK	5930	3/26	4 9	15.6	55.5	28.7
ISH CREEK	8000	3/29	46	9.4	14.5	10.2	FIKE CRESK PILLON	5930	4/01	S P	17.4	24:0	30.1
ISHEP CREEK	9100	3728	8.3	29.3	31.9	41.1	PIPESTONE PASS	7200	3/20	5.5	5.0	6.5	6.1
ISHER CREEK PILLOW	9100	4/01	SP	26.7	28.5	38.0	PLACER BASIN F	8830	3/26	60	18.0A	19.0	22:4
TVE-BULL	5700	3731	0	. 0	3.9	7.2	PLACER BASIN PILLOW	8830	4/01	SR	15.6	14.5	17.9
LATTOP MOUNTAIN PILLOW	6300	4/01		33.6	45.6	49.7	POORMAN CREEK	5100	3/30	6.5	24.2	34.5	36.9
LEECER RIDGE	7500	3730	3.6	8.4	12.1	12.0	C POORMAN CREEK PILLOW	5100	4/01	SR	21.4	27.9	3318

DRAMAGE BASIN ING W SNOW COURSE		Bare at Survey	Shirt Dech	Mace Content	exer Cante	المعتبدويد
NAME	Desc	of Survey	(Sinchee)	()nchat)	Çett Yen	Aim+g*
PORCURINE	6500	3/30	3.5	9.1	6.0	8.
PORCUPINE PILLOW	6500	4/01	5 P	8.8	5.5	9.1
ROTOMAGETON PARK	7150	3/30	4.8	14.6	16.4	15.4
PED MOUNIAIN	6000	4/02	3.8	11.8	21.0	19.
RED TOP	5260	3/26	\$ 8	17.8	34.2	32.
ROCK CREEK	\$600	3/29	5.1	17.0	3.2	10.
ROCK CREEK MEADOWS	3160	3/28	66	18.5	20.4	24.
ROCKER PERK	8000	3/29	5.0	13.6	13.4	16.
ROCKER PEAK RILLOW	3000	4701	5.0	11.3	12.9	15.
BOCKY BOY	4700	3/29	21	6.4	.0	5.
ROCKY BOY PILLOW	4700	3/29	SP	6.2	3.3	\$.
SACAJAWEA	65\$0	3/29	5.5	16,7	14.6	15.
SADDLE MOUNTAIN	7940	3/26	7.8	23.2	25.6	26.
SADDLE MOUNTAIN PILLOW	7900	4/01	SR	24.2	23.5	27.
SAND BASIN LOWER	6480	3/28	40	9.8	11.6	15.
SENTINEL CREEK	8300	3730	63	21.8	26.4	25.
SHOWER FALLS	8100	3/26	30	24.3	55.6	24.
SHOWER FALLS PILLOW	3100	4/01	SP	26.1	23.3	24.
SILVER RUN	6630	3/27	3.1	6.0	5.5	6.
SILVER RUN RILLOW	6630	4/01	SP	7.2	5.4	6.
SKALKAHO SUMMIT	7250	3/27	7.4	20.7	21.2	27.
SKALKAHO SUMMIT PILLOW	7250	4 / 01	SP	19.5	22.8	27.
SKYLARK TRAIL PILLOW	6200	4/01	5 P	27.7	29.6	35.
SLAGª AªMELT LAKE	8750	3/27	84	24.5	30.75	27.
SLIDE ROCK MOUNTAIN	7100	3/28	5 2	14.6	12.8	18.
	6960	3/30	5.2	13.5	13.6	10.
SMUGGLER MINE SOUTH FORK SHIELDS	8100	3/30	86	30.0		56.
					22.0	18.
SOUTH FORK SHIELDS PILLOW	3100	4/01	5 0	21.9	15.1	
SROTTED BEAR MOUNTAIN	7000	4/01	3.4	11.4A	12.4	15.
SPUR PARK	8100	3/28	61	19.6	16.0	22.
SPUR PARK PILLOW	8100	4/01	SP	19.8	17.7	23.
STAHL PEAK	6030	3/30	9.6	34.7	41.1	41.
STAHL PEAK PILLOW	6030	4/01	5 R	28.5	34.3	35.
STAR LAKE E	9650	3/26	7.8	29.SA	36.\$	46.
STEMPLE PASS	6600	3/28	3.4	7.2	8.2	11.
STORM LAKE	7780	4/03	5 4	18.3	14.4	14.
STRYKER BASIN	6180	3/27	81	27.0	31.4	37.
STUART MILL	65 00	3/30	53	6.4	6.2	7.
STUART MOUNTAIN	7400	3/31	91	34.0	34.6	34.
SUCKER CREEK	3960	3/59	0	0	- 0	n.
FAYLOR ROAD	4080	3/29	1.4	3.6	-0	S.
TEN MILE LOWER	6600	3/27	3.0	6.7	5, ?	8.
TEN MILE MIDDLE	6800	3727	4.5	10.2	9.2	12.
TEN MILE UPPER	8000	3/27	5 4	12.4	10.4	14.
TEPEE CREEK	8000	3/28	5 9	16.1	50.5	16.
TEREE CRESK PILLOW	8000	4/01	5 P	14.5	17.1	13.
TIMBERLINE CRESK	8850	3/27	6.3	12.8	15.2	15.
TRAIL CREEK	7090	3/29	3.9	8.6	6.6	9.
TRINKUS LAKE	6100	4/01	113	43.0	43.0	45.
TRUMAN CREEK	4060	3/28	4	1.2	.0	2.
TV MOUNTAIN	6800	3/31	5.7	19.4	18.2	20.
TWELVEMILE CREEK	5600	3/29	49	17.3	16.7	23.
TWELVEMILS CREEK PILLOW	5600	4701	\$ P	14.7	15.2	50.
TWENTY-ONE MILE	7150	3/30	49	14.4	17:9	TB.

10W April 1. 1984			THESTERR		PAST RI	
Device of Bernary in 2 mod Constit		Date of Survey	Snem Deeth (Inches)	Name Content (Inches)	Color Conto	Acorde
YOMING	Comme				(11)	710-00
STED MODALVIA (MA)	0880	3728	8.2	21.9	19.3	24.2
CTUD TOUNTAIN DILLAG CUYS	9380	4/01	SP	8.05	16.7	-
CKARELIGIE LAKE BILLUM (DAY)	9270	4/01	5.0	14.9	17.9	-
04.05.32 6" 2" (NA.	7820	4/02	5.3	10.3	6.6	8.8
SURGESS 9"S" PILLOW (HY)	7830	4/01	SP	12.3	11,5	-
CANYON PILLOW (WY)	7940	4701	SP	11.5	12.0	16.
EAST ENTRANCE (MY)	6960	3 / 30	5.6	6.8	9.5	٩.
LAKE CANO (WY)	9500	4/01	4 Z	55.5	16.1	4.0
LUPINE CREEK (MY)	7780	3/30	3.2	8.2	818	10.
VORRIS BASIN (WY)	7380	4/01	3.1	7.6	10.1	11.
NORTH TONGUE (WY)	7500	4/01	3.0	7.0	8.4	11.
	8450	4/02	5.2	13.1	12.0	14.
PARKERS DEVK BIFFOM (MA)	7400 9400	4/01	39 50	10.2 17.6	16.4	16.
SYEVAN LAKE RILLOW (WY)	8420	4701	5 P	20.3	21.4	
STEVAN RASS (UY)	7100	3730	34	9.8	10.7	13.
HOWE CINIDE (MA)	7990	3/29	5.0	14.8	18.2	55.
TOGHOTE PASS (WY)	9580	3/29	7.5	26.3	27.3	30.
AUTABLINE (MA)	7650	3/30	27	6.5	11.7	13.
NOTAESINE OILTON (MA)	7650	4/01	5 P	6.7	10.0	
TOUNTS PERK (MY)	8350	3/28	3.7	11.8A		21.
LBERTA						
AKAMINA (AL)	\$810	3/27	4.6	12.1	19.8	-
AKAMINA PILLON (AL)	5810	4701	5.6	12.2		
*ULTSON PASS (AL)	6490	3/27	4.4	12.1	15+7	19
BOW RIVER (AL)	\$0.80	3/29	5.5	5.6	8.1	8
PDW RIVER SUMMIT (AL)	6660	3728	44	13.0	13.4	1.4
CHATEAU LAWN CALL	5710	2150	2.8	7.7	10.9	1.0
CUTHEAD LAKE (AL)	7250	3758	4.6	13.0	11.9	1.5
HIGHWOOD SUMMIT RUSH (AL)	7250	2/27	4.8	13.0	12.8	1.5
CATHERINE LAKE (AL)	7810	3758	5.3	15.3		
LARCH VALLEY (AL)	7740	3/28	\$ 0	14.9	16.1	
LEE (REEK O (AL)	4890	3/28	1.3	4.1	6.2	7
TITILE ELBOW SUMMIT CALL	7090	3/27	40	9.2	10.9	' '
LITTLE ELBOW SUMMIT PILLOW		4/01	\$ P	11.5	0.7	1
MIDDLE ORYMODO (AL)	5150	3/27		9.4	11.2	11
FIRROR LAKE (AL)	6570	3/29	36 23	5.9	8.0	
MIST CREEK (AL)	5740 6740	3728	4.5	15.5	11.9	1.3
MOUNT SKOKI (AL)	6200	3/27	37	10.1	11.7	1.5
MUD LAKE (AL)	\$300	3/59	25	6.0	9.0	
PIPESTONE UPPER (AL)	7150	3/28	4.8	14.8	12.8	1.6
PTARMIGAN HU1 (AL) SUNSHINE VILLAGE (AL)	7300	3/29	63	18.4	20.2	2.5
SUNSHINE VILLAGE PILLOW (A		4/01	S P	20.6		
THREE ISLE LAKE (AL)	7090	3/27	67	21.4	19.8	
VILKINSON SUMMIT BUSH (AL)		3/27	24	5.4	6.4	А
WILKINSON SUMMIT OPEN (AL)		3/27	2.0	3.9	3.7	

NOW April 1, 1984		( <del>-</del>	THIS YEAR		PAST I	
DRAINAGE BASIN MAPOR SNOW COURSE	Elevation	Det# #1 Survey	Snum Depth (Inches)	Micror Contant) (Insphilt)	Latt Year	Arreje
HAME	Filestica					
TWIN CREEKS	3580	4/01	1.3	S.1A	5.5	11.6
TWIN LAKES	6510	3/29	103	35.4	36.3	44.1
TWIN LAKES PILLOW	6400	4/01	5 P	31.1	35.2	42.4
UPPER HOLLAND LAKE	9500	3/31	8.4	30.6	26.9	37.5
WALDRON	5600	3/27	1 4	3.8	7.2	11.2
WALORON PILLOW	5600	4/01	5 P	6.0	7.9	10.1
WARM SPRINGS	7800	4/0\$	60	19.1	18.3	21.1
WARM SPRINGS PILLOW	7800	4/01	SP	20.9	19.0	23.2
WEASEL DIVIDE	\$450	3/30	65	23.3	36.1	35.4
WEST ROSEBUO	7500	3/28	3 1	7.8	8.3	12.4
WEST YELLOWSTONE	6700	3/30	3.5	9.6	12.5	12.5
WEST YELLOWSTONE PILLOW	6700	3/30	Ş P	8.1	11.0	10.4
MHISKEY CREEK	6800	3/56	5.6	16.7	24.2	21.9
WHISKEY CREEK PILLOW	6800	4/01	5 P	13.1	18.5	18.3
WHITE MILL	8700	3/28	65	21.0	24.8	29.6
WHITE MILL PILLOW	8700	4/01	5 P	18.6	21.9	26.3
WHITE PINE RIDGE	8850	3/28	3.6	7.1	7.1	\$.8
WILLOW CREEK	6500	3/29	3 6	10.0	8.2	9,7
WOOD CRESK	5960	3/31	19	4.7	9.8	14.8
WOOD CREEK PILLOW	5960	4/01	5 P	4.5	7.9	1\$.2
WRONG CREEK	5700	3/30	2.5	7.0	9.8	15.0
WRONG RIDSE	0086	3/30	4.3	11.8	13.6	20.9
DAHO						
ABOVE BUR(t (ID)	4100	3/30	3.7	14.2	15.4	24.0
BEAR MOUNTAIN (ID)	5400	3/30	98	41.2	66.1	65.9
BEAR MOUNTAIN PILLOW (ID)	\$400	4701	\$ P	38.1		
BIG SPRINGS (ID)	6500	3/28	5.6	17.8	23.2	21.9
BLACK CANYON (ID)	7960	3/28	9.5	29.8	40.1	35.8
BLACK MOOSE (ID)	8160	3/28	93	29.0	45.2	40.6
BLUE LEDGE MINE (ID)	6900	3/29	5.5	16.0	31.0	1.7 5
CAMR CREEK (ID)	6580	3/28	3.9	9.5	17.8	11.5
CPAS CREEK (ID)	6860	3/29	5.5	15.0	28.8	-
CPAB (REEK PILLOW (ID)	6860	4/01	SP	15.2	30.3	
GOA1 LAKE (ID)	6500	3/30	110	33.3A	-	47.7
HUMBOLDT SULCH (ID)	4250	3/30	2.5	9.0	11.6	-
HUMBOLDT GULCH PILLOW (IO)	4250	4/01	5 P	7.0	10.1	
ISLAND PARK (ID)	65 9 0	3/28	s 0	16.0	20.7	17.4
ISLAND PARK RILLOW (ID)	65.40	4/01	SP	15.3	21.0	-
KILGORE (ID)	6320	3/29	4.0	13.7	15.2	11.8
KIT CARSON (IO)	4950	3/28	2.8	9.0	4.7	9.4
LATHAM SPRINGS (ID)	7630	3/28	9.0	25.5	36.4	31.4
LOLO PASS (ID)	5230	3/28	5.9	20.8	55.0	31.8
LOLO PASS PILLOW (ID)	\$230	4/01	SP	22.7	-	-
LOOKOUT (ID)	5250	3/30	69	25.4	33.0	
LUCKY DOG (ID)	6860	3/28	72	23.4	31.2	25.9
MOOSE CREEK (ID)	6200	3/30	6.2	19.2	18.4	16.8
MODSE CREEK PILLOW (ID)	6200	4/01	5 P	20.9	19.9	-
MOSQUITO RIDGE (ID)	5200	3/31	7.8	28.2	42.6	38.9
MOSQUITO RIDGE PILLOW (ID)		4/01	SP	28.6	43.9	-
SAVAGE PASS (ID)	6170	3/28	6.8	21.5	23.0	
SAVAGE PASS PILLOW (ID)	61.70	4/01	SP	8.55	-	-
SANTELL MOUNTAIN (ID)	8720	3/28	103	34.9	51.0	35.9
SMITH CREEK (ID)	4800	3/29	92	35.5	51.8	
SUNSET (10)	5540	3/31	64	22.64	_	35.1
SUNSET PILLOW (ID)	5540	4/04	5 P	29.4	38.3	
TARGHEE PASS (10)	6980	3/28	EST	12.8	20.1	
VALLEY VIEW (ID)	6680	3/28	4.8	14.3	21.9	
WHITE ELEPHANT (ID)	7710	3728	7.3	23.1		
WHITE ELEPHANT PILLOW (10)			5 P	24.5		

NOW April 1, 1984			TIDS YEAR		PASTRI	CORD
NAME NAME WITH STOR COURSE	Eleventos	E	Sham Units (Thibbit)	(24 t h; +4)	L til Year	Artiert
RITISH COLUMBIA						
BEAVERFOOT (BC)	6200	3/29	2.0	4.1	8.9	9.6
FANIE (BC)	3510	3/28	0	.0	4.6	7.7
ERNIE EAST (BC)	4100	3/28	5.8	8.7	15.5	15.2
ERNIF NE (BC)	3510	3/28	1.2	3.74	9.6	10.0
IDELITY MOUNTAIN (BC)	6130	3/29	113	42.0	34.9	49.1
IELO (BC)	4200	3730	1.0	2.6A	4.7	57.
LOE LAKE (BC)	6860	3/29	1.8	23.2	24.4	31
LACIER (SC)	4100	3729	5.9	22.7	21.9	27:
RAY CREEK LOWER (AC)	\$080	3728	5.1	16.7	15.2	T 9.
RAY CREE( UPPER (AC)	6260	3728	8.1	27.5	25.9	311
ICKING HORSE (BC)	5410	3730	3.\$	11.3	11.4	14.
IMBERLEY (BC)	3800	3730	0	. O A	2.5	6.
IMBERLEY LOWER VOR (8C)	4490	3/10	1.6	2.2	5.4	7.
IMBERLEY MIDDLE VOR (80)	5510	3730	2.8	B.0	9.8	12.
IMBERLEY UPPER VOR (OC)	7020	5730	4.2	13.4	15.I	20:
ARBLE CANYON (BC)	4990	4/02	3.4	7.8	11.7	14.
ORRISSEY RIDGE (RC)	6100	3/28	59	20.2	28.4	28.
(OC) ICEBA INUO	6490	3725	114	40.4	40.9	50.
OUNT ASSINIBOINE (BC)	7310	3/29	61	17.1	19.7	21.
OUNT JOFFRE (BC)	5740	2/29	3.7	9.9	15.9	15.
OYIE MOUNTAIN (BC)	6360	3/27	4.2	12.8	17.6	18.
INCLAIR PASS (PC)	4490	3730	1.4	3.1	3.3	\$'-
ULLIVAN MINE (BC)	5080	3/30	2.6	6.7	11.6	14.
HUNDER CREEK (BC)	6590	3/29	3.8	7.7	10.1	1 I .
IPPER ELK RIVER (BC)	4400	3730	0	.0	_ 0	6.
VERMONT CREEK (BC)	4990	3/29	3.2	9.1	17.2	20.

SP - Snow Pillow observations; water content only.
A - Aerial observation; water content estimated.



SHOWMELT AND RAINFALL HAVE STARTED DEVELOPING DRAINAGE CHANNELS IN THE MOUNTAIN SHOWPACK. PERIODIC MEASUREMENTS OF SHOW DEPTH AND WATER CONTENT HELP PREDICT SHOWMELT RUNOFF AND TIMING.

MONTANA WATER SUPPLY OUTLOOK Page 5

MONTANA WATER SUPPLY OUTLOOK Page 4

# Columbia River Drainage

STOR A MELOW EODECASTS		THIS YE	in:	0317	163.	THS	-1 ++	P15* 1	rco*0	7615	YEAT	0+51	110010
STREAMFLOW FORECASTS		10410	457	* mry ys a a * d	AND DESCRIPTION OF	108	C#57	THOUSAND A	COL FILT	FORE	CAST	THOUSAND A	CTETET
HASIN STIFFAR WATER FORECAST POINT		Now Car E	Augusta Augusta	6.011.000	• • • •	#10-110-1 # 11 # pu =	Ass class	2.00.000	Asset	Thousand Acre Fees	Receive y I Average	Lintes	Average
ot s	60	А	pril -	September			April	• July			April	- June	
KOOTENAI RIVER below Libby Dam (1)		5,310	75	6,356	7,041	4,540	75	5,346	6,020				
FISHER RIVER near Libby		135	51	0,330	264	125	50		248				
YAAK RIVER near Troy		275	53		523	260	52		500				
KOOTENAI RIVER at Leonia (1)		6,260	73	7,948	8,602	5,460	73	6,857	7,498	4420	73	5,157	6,051
INFLOW HOLLTON RESERVOIR or BUTTE (Million Gallons).				,,,,,,		210	80	182	263	192	81	179	237
WARM SPRINGS CREEK AT MEYERS DAM near Anaconda (2) .		41.5	89		46.8	33.3	88		37.8				
FLINT CREEK near Southern Cross (3)		14.8	81	18.9	18.3	12.5	81	15.2	15.4				
FLIST CREEK below Boulder Creek (4)		60.5	80		75.8	47.5	80		59.5				
INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5) .		11.0	70	11.6	15.7	10.2	68	10.2	14.9				
MIDDLE FORK ROCK CREEK near Phillpsburg		64.0	82	• • • • • • • • • • • • • • • • • • • •	78.2	58.0	82		70.5				
NEVADA CREEK near Finn	4.00	14.0	61		23.0	12.8	60		21.3				
BLACKFOOT RIVER near Bonner		710	71		999	625	69		904	540	69		782
CLARK FORK RIVER above Milltown (6)		700	86		816	610	86		708	520	87		597
CLARK FORK RIVER above Missoula		1,410	78	1,362	1,815	1,235	77	1,133	1,612	1060	77	880	1,379
WEST FORK BITTERROOT RIVER near Conner (7)		132	74		178	120	73		164				
BITTERROOT RIVER near Darly		410	71		580	375	70		532	330	7.1		464
SKALKAHO CREEK near Hamilton	4.00	48.3	86		56.0	42.0	86		48.7				
HURNT FORK CREEK near Stevensville (8)	4.00	31.5	84		37.4	27.0	84		32.2				
RITTERROOT RIVER at Missoula (9)		1,040	69		1,504	955	69		1,384	835	70		1,191
CLARK FORK RIVER below Missoula		2,450	74		3,319	2,190	73		2,996	1,895	74		2,570
CLARK FORK RIVER at St. Regls		3,290	75	3,450	4,411	2,970	75	3,073	3,928	2,570	75	2,437	3,428
NORTH FORK FLATHEAD RIVER near Columbia Falls		1,400	73		1,913	1,240	72		1,732	1,050	71		1,471
MIDDLE FORK FLATHEAD RIVER mear West Glacier		1,360	73	1,545	1,869	1,240	72	1,401	1,713	1,050	72	1,122	1,453
SOUTH FORK FLATHEAD RIVER near Columbia Falls (10) .		1,700	75	1,847	2,278	1,575	74	1,715	2,142	1,400	74	1,416	1,886
FLATHEAD RIVER at Columbia Falls (10)		4,270	74	4,943	6,208	4,220	74	4,508	5,721	3,670	75	3,654	4,921
SWAN RIVER near Blg Fork		585	85		689	510	84		604		70.00	4 400	5 700
FLATREAD RIVER near Polson (11)		5,400	74	6,130	7,278	4,950	74	5,538	6,712	4,300	75	4,420	5,759
CLARK FORK RIVER near Plains (11)		8,470	70	9,880	12,153	7,720	70	8,748	11,071	6,620	70	6,902	9,459
THOMPSON RIVER near Thompson Falls		172	66		261	150	64		233				
PROSPECT CREEK at Thompson Falls		93.0	65		142	86.0	65		132	2 000	/ 0		
CLARK FORK RIVER at Whitehorse Rapids (12)		9,320	69		13,575	8,480	69		12,351	7,290	69		10,570

- Adjusted for storage in Lake Koocabusa.
   Adjusted for storage in Silver Lake, diversions to end pumping from Georgetown Lake.
   Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake, diversions from and pumping to Silver Lake.
   Sum Filst Creek at Hazville and Boulder Creek at Hazville.
   Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall. Creek near Hall.
- (6) Difference in absenced flow Clark Fork above Missouls and Blackfoot near Bonner.
- (?) Adjusted for storage in Painted Bocks Reservoir (8) Adjusted for diversion into Sunset Highling
- (9) Difference to observed flow Clark fork above and
- below Missoula.

  (10) Adjusted for storage in Hungry House Reservoir.

  (11) Adjusted for storage in Hungry House Reservoir and Flathead Lake.
- (12) Adjusted for storage in Hungry Horse Reservoir Flathead Lake and Noxon Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

	Fly w Po	Paried		
STREAM or AREA	Spring Seaton	Lu-u Seucon		
Tobacco	Fair	Poor		
Little Bitterroot	Fair	Poor		
Mission Valley	Fair	Fair		
Flint Creek	Fair	Fair		
Upper Clark Fork	Fair	Fair		
Nevada Creek	Fair	Fair		
Blackfoot	Fair	Poor		
West-side Bitterroot	Fair	Fair		
East-side Bitterroot	Fair	Fair		
Bitterroot River	Fair	Fair		
Lower Clark Fork	Fair	Poor		

#### Below average snowpack continues

Snowpack showed good increases in the southern part of the drainage but remained well below average in the Kootenai River headwaters and Lower Clark Fork River drainage.

Even with this good snowfall, most areas still have below average snowpack. Only the Swan Range, Mission Mountains and an area along the Continental Divide near Butte have near to a little below average

Low elevation snows are melting in the Kootenai, Flathead and Lower Clark Fork River drainages.

CANADA

COLUMBIA RIVER DRAINAGE

MONTANA MOUNTAIN SNOW WATER EQUIVALENT

	RIVER BASIN	Humber sT Courses	THIS TEAR'S SNOW WATER AS PERCENT OF		
	SUB-RATERSHED	Averaged	FACCAMPA	ARMER +	
	fant Kootenay/8C.	. 26	116	67	
- 11	Kootenai/Montana	30	68	57	
14	Kootensi above				
1	Bonners Ferry	. 56	82	61	
	Little Bitterroot	. 9	76	5.3	
	N. Fk. Flathead	. 13	75	68	
	M. Fk. Flathead.	. 13	81	64	
-11	S. Fk. Flathead.	. 13	101	88	
4	Swan	. 11	99	92	
	Flathead	. 59	89	77	
	Stillwater &				
- 11	Whitefish	. 9	79	63	
	Clark Fork above				
	8lackfoot	. 43	94	80	
	8lackfoot	. 23	92	67	
	Upper Clark Fork				
	above Missoula	. 66	93	75	
	Sitterroot	. 22	96	80	
	Lower Clark Fork				
	below Missoula	. 19	86	64	
	Clark Fork (Total	1			
	w/o Flathead)	. 107	92	7.3	
	Pend O'Reille				
	(Clark Fork &				
	Flathead)	166	91	75	
	Columbia (Pend				
	O'Reille &				
	Kootenai)	222	89	71	

SUMMARY OF SNOW MEASUREMENTS

### Below average streamflow forecasts

Spring and summer runoff forecasts have increased in the Bitterroot, Upper Clark Fork and Blackfoot River drainages. Forecasts have remained about the same as last month in the Flathead River and have decreased for the smaller streams flowing into the Lower Clark Fork and Kootenai

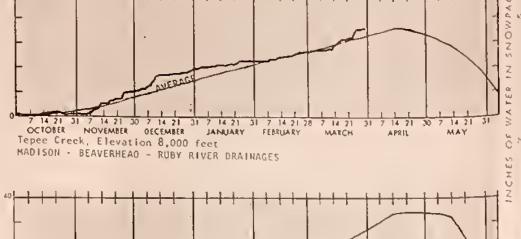
Streamflows are expected to be below average in all drainages and very low on smaller streams in the northwest corner.

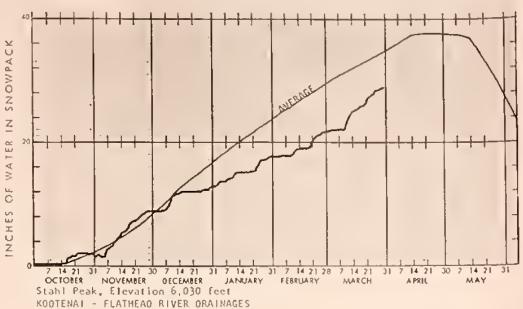
Some shortages of irrigation water are expected on all streams not having stored water. Streamflows will begin dropping sconer than usual and shortages of irrigation supplies will probably begin to develop earlier than normal.

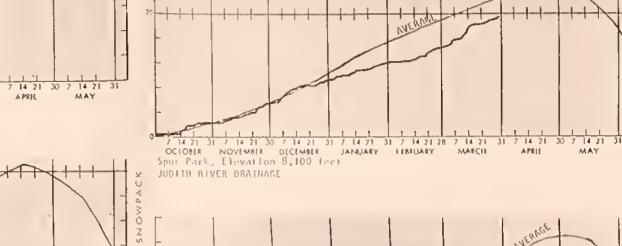


CARRYOVER STORAGE FROM LAST YEAR'S GOOD RUNOFF, COMBINED WITH WINTER AND SPRING RUNOFF WILL ENABLE MOST RESERVOIRS IN THE STATE TO FILL THIS YEAR. THIS STORED WATER IS EXTREMELY VALUABLE IN WATER SHORT YEARS SUCH AS THIS ONE.

# SNOW PILLOW DATA

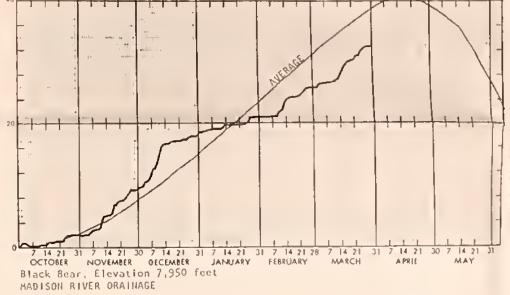


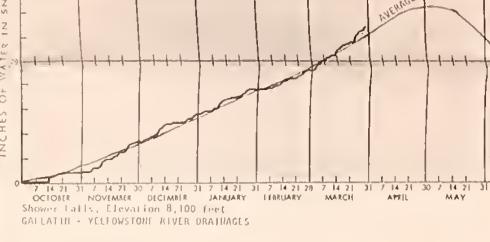


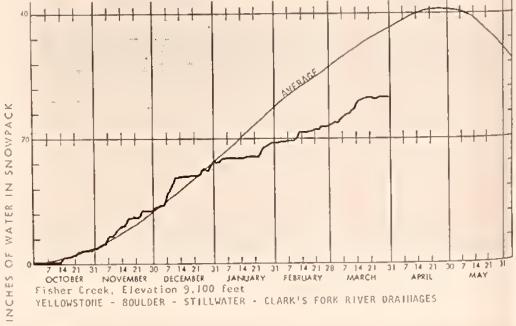


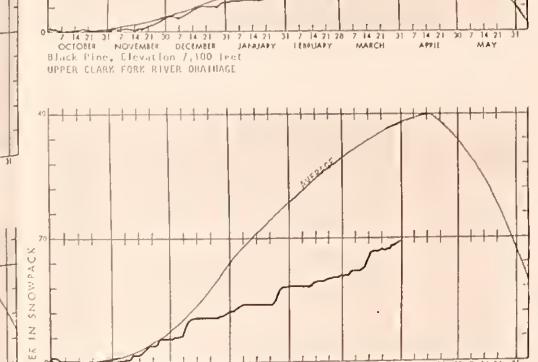
BITTERROOT RIVER DRAINAGE

? 14 21 31 : 14 21 30 7 14 71 31 7 14 21 31 7 14 21 28 7 14 71 31 7 14 21 30 7 OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL 78 IN Cakes, Elivation 6,510 first

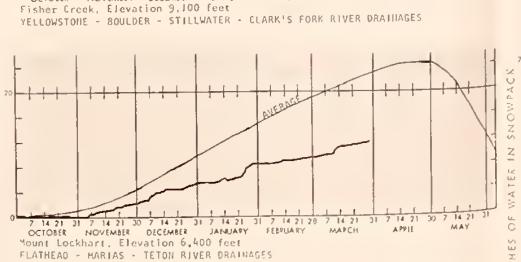








OCTOBER HOVEWEER DECEMBER JANEARY FIBRUARY MARCH



MONTANA WATER SUPPLY OUTLOOK Page 6

LEGEND - Diamage Boundary ▲ Goging Station %1961-80 AVERAGE 0ver 130 % 110 - 130%

90-110%

70-90%

Under 70%

### SATELLITE SNOW COVER



Snow Covered Area

Scale 1:2,500,000

#### MISSOURI RIVER BASIN

	AVERACE SNOWLINE		
DATE		PERCENT SNOW COVER	ELEVATION IN FEET
November 29,	1983	99.1	3940
December 20,	1983	100	3800
January 9,	1984	72	5720
January 31,	1984	78	5440
February 8, 1 February 27,	1984	74 100	5630 3800
April 3, 1984	1	74	5630



#### AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

#### GOVERNMENT AGENCIES

Department of the Environment Atmospheric Environment Service Water Management Service British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section
Alberta Environment Technical Services Division

Federal

Department of the Army - Corps of Engineers Department of Agriculture -

RESERVOIR ST

Kootenna Flathead

Clark Fort

Bitterroot

8eaverhead

Gallatin Missouri

Musselshe